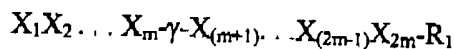


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Patent

IN THE CLAIMS

Please replace claims 1 and 49 with the following amended claims. A marked up version of the claims, indicating the changes made, is attached hereto as appendix A.

1. (Twice amended) A method for designing a specific polyamide



wherein

$X_1, X_2, X_m, X_{(m+1)}, X_{(2m-1)},$ and X_{2m} are carboxamide residues forming carboxamide binding pairs $X_1/X_{2m}, X_2/X_{(2m-1)}, X_m/X_{(m+1)},$

γ is γ -aminobutyric acid or 2,4 diaminobutyric acid, and

R_1 is $-\text{NH}(\text{CH}_2)_{0-100}\text{NR}_2\text{R}_3$, $-\text{NH}(\text{CH}_2)_{0-12}\text{CONH}(\text{CH}_2)_{0-100}\text{NR}_2\text{R}_3$, or $-\text{NHR}_2$, where R_2 and R_3 are independently selected from the group consisting of H, Cl, NO, N-acetyl, benzyl, C_{1-100} alkyl, C_{1-100} alkylamine, C_{1-100} alkyl diamine, C_{1-100} alkylcarboxylate, C_{1-100} alkenyl, a C_{1-100} alkynyl, and C_{1-100} alkyl-L, where L is selected from the group consisting of arylboronic acids, biotins, polyhistidines comprised from about 2 to 8 amino acids, haptens, solid phase supports, oligodeoxynucleotides, N-ethylnitrosourea, fluorescein, bromoacetamide, iodoacetamide, DL- α -lipoic acid, acridine, captothesin, pyrene, mitomycin, texas red, anthracene, anthrnilic acid, avidin, DAPI, and oligodeoxynucleotide, isosulfan blue, malachite green, psoralen, ethyl red, 4-(psoraen-8-yloxy)-butyrate, taartaric acid, and (+)- α -tocopheral, suitable for use as a DNA-binding ligand that is selective for identified target DNA sequences $5'-\text{WN}_1\text{N}_2 \dots \text{N}_m\text{W}-3'$ where m is an integer having a value from 3 to 6, the method comprising:

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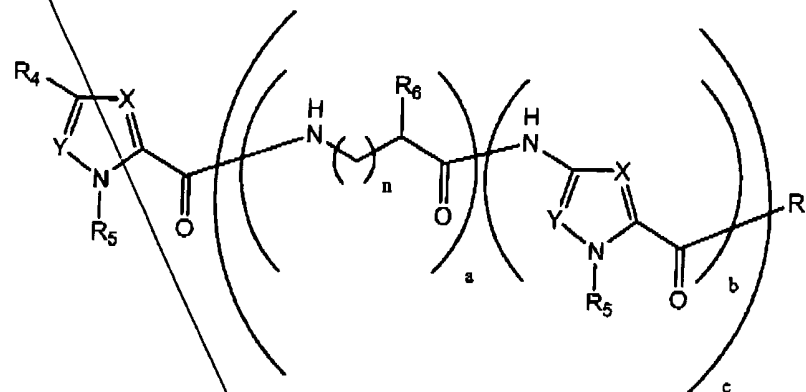
- (a) identifying a target sequence of double stranded DNA having the form 5'-WN₁N₂ ... N_mW-3', N₁N₂ ... N_m being the sequence to be bound by carboxamide residues, wherein each N is independently chosen from the group A, G, C, and T, each W is independently chosen from the group A and T, and m is an integer having a value from 3 to 6;
- (b) representing the identified sequence as 5'-Wab ... xW-3', wherein a is a first nucleotide to be bound by the X₁ carboxamide residue, b is a second nucleotide to be bound by the X₂ carboxamide residue, and x is the corresponding nucleotide to be bound by the X_m carboxamide residue;
- (c) defining a as A, G, C, or T to correspond to the first nucleotide to be bound by a carboxamide residue in the identified sequence;
- (d) selecting Im as the X₁ carboxamide residue and Py as the X_{2m} carboxamide residue if a = G;
- (e) selecting Py as the X₁ carboxamide residue and Im as the X_{2m} carboxamide residue if a = C;
- (f) selecting Hp as the X₁ carboxamide residue and Py as the X_{2m} carboxamide residue if a = T;
- (g) selecting Py as the X₁ carboxamide residue and Hp as the X_{2m} carboxamide residue if a = A; and
- (h) repeating steps c - g for b through x until all carboxamide residues are selected;
- wherein Im is N-methylimidazole, Hp is , Py is N-methylpyrrole, A is adenine, G is guanine, C is cytosine, and T is thymine.

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49. (Amended)

A polyamide designed by the method of claim 1, having the structure:



wherein

R_4 is selected from the group consisting of H, NH_2 , SH, Cl, Br, F, N-acetyl, and N-formyl;

each R_5 is independently selected from the group consisting of H, $(\text{CH}_2)_{0-6}\text{CH}_3$, $(\text{CH}_2)_{0-6}\text{NH}_2$, $(\text{CH}_2)_{0-6}\text{SH}$, $(\text{CH}_2)_{0-6}\text{OH}$, $(\text{CH}_2)_{0-6}\text{N}(\text{R}_7)_2$, $(\text{CH}_2)_{0-6}\text{OR}_7$, and $(\text{CH}_2)_{0-6}\text{SR}_7$, wherein R_7 is $(\text{CH}_2)_{0-6}\text{CH}_3$, $(\text{CH}_2)_{0-6}\text{NH}_2$, $(\text{CH}_2)_{0-6}\text{SH}$, or $(\text{CH}_2)_{0-6}\text{OH}$;

each R_6 is independently selected from the group consisting of H, NH_2 , OH, SH, Br, Cl, F, OMe, CH_2OH , CH_2SH , and CH_2NH_2 ;

R_1 is $-\text{NH}(\text{CH}_2)_{0-100}\text{NR}_2\text{R}_3$, $-\text{NH}(\text{CH}_2)_{0-12}\text{CONH}(\text{CH}_2)_{0-100}\text{NR}_2\text{R}_3$, or $-\text{NHR}_2$, where R_2 and R_3 are independently selected from the group consisting of H, Cl, NO, N-acetyl, benzyl, C_{1-100} alkyl, C_{1-100} alkylamine, C_{1-100} alkyldiamine, C_{1-100} alkylcarboxylate, C_{1-100} alkenyl, a C_{1-100} alkynyl, and C_{1-100} alkyl-L, where L is selected from the group consisting of arylboronic acids, biotins, polyhistidines comprised from about 2 to 8 amino acids, haptens, solid phase supports, oligodeoxynucleotides, N-ethylnitrosourea, fluorescein, bromoacetamide, iodoacetamide, DL- α -